ABSTRACT

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Title of diploma thesis: The impact of selected prenylflavonoids on the effect of anticancer therapy in human colon adenocarcinoma cell line

In recent years, hops prenylflavonoids have been the subject of the research by many scientists because of the wide spectrum of their biological effects. They have been confirmed, among other things, as effective antiproliferative drugs for colorectal cancer cells. Oxaliplatin is an effective alkylating cytostatic, whose main indication is the treatment of colorectal cancer. However, using oxaliplatin in therapy of cancer is limited by its neurological toxicity. When used in combination with other drugs, as it is used in clinical practice, it is possible to reduce therapeutic dose without loss of effect. Current therapeutic regimens with oxaliplatin are not free from this neurological toxicity. It would be helpful to find a substance that would help reduce the dose while being as non-toxic as possible. The aim of this work is to evaluate the effect of xanthohumol, isoxanthohumol and oxaliplatin on SW620 colorectal carcinoma cells and study the impact of selected prenylflavonoids on the effect of oxaliplatin therapy in human colon adenocarcinoma cell line. The thesis also deals with determination of the mRNA expression changes of selected biotransformation enzymes (carbonylreductase 1, quinon reductase 1, sulfotransferase 1A1, glutathione-S-transferase and catechol-O-methyltransferase 2) associated with cancer. The antiproliferative effect of xanthohumol and isoxanthohumol was confirmed. Synergistic effect of combination was not observed. Result of gene expression quantification demonstrated that isoxanthohumol decreased the expression of GSTP-1, while CBR1 expression was increased. According to this particular study, prenylflavonoids combined with oxaliplatin are not favorable for the combination therapy.